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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/545,554 04/07/00 HOOK

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006111
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QM02/0123

EXAMINER

KIM, T

ART UNIT

PAPER NUMBER

3746

DATE MAILED:

01/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/545,554

Applicant(s)

HOOK ET AL.

Examiner

Ted Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) ____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 17) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: _____.

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DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 130. Correction is required.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the water injection nozzle connected to the innermost swirl cup 72, 74 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1, 5, 6, 12-15, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Schelp teach a gas turbine combustor operating at a fuel/air ratio of less than one, i.e. fuel lean, (col. 3, lines 10+) and supplying water/steam 44 to the combustor to a premixing region 48 of the combustor (col. 2, lines 47-59). The water injection

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system would inherently be able to operate in a first and second mode depending on the load.

5. Claims 1, 5, 6, 12-15, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (3,313,103). Johnson teaches a gas turbine combustor and supplying water via 13, 14 to the combustor where the combustor 28 operates with a premixed fuel and air in 16 (Fig. 3 and col. 4, lines 25+). The water injection system would inherently be able to operate in a first and second mode depending on the load. Note this combustor is inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized. Moreover references such as Aguet specifically teach that conventional gas turbine combustors operate lean (see col. 3, lines 24-30).

6. Claims 1, 5, 6, 12-15, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Moss (891,715). Moss teaches a gas turbine combustor (col. 1, lines 9+) and supplying water via 19 to the combustor 15 where the combustor 15 has premixed fuel and air in 28. The water injection system would inherently be able to operate in a first and second mode depending on the load. Note this combustor is inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized.

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7. Claims 1, 5, 6, 12-15, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Horner et al (5,274,995). Horner et al teach a gas turbine combustor 14 and supplying water via nozzle 26 (col. 3, lines 29+) to the combustor where the combustor operates with premixed fuel and air (col. 5, lines 1-16). The water injection system would inherently be able to operate in a first and second mode depending on the load. Note this combustor is inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized.

8. Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Borkowicz et al (5,259,184). Borkowicz et al teach a gas turbine combustor and supplying water via nozzle 94, 98 (col. 6, lines 41+) to the combustor where the combustor operates with premixed fuel and air. The water injection system would inherently be able to operate in a first and second mode depending on the load. Note this combustor is inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized. There are further a plurality of domes, any 3 of which can be read on the claimed 3 domes (see figs. 1 & 5).

9. Claims 1-3, 5-8, 11-14, 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Hilburn et al (5,987,875). Hilburn et al teach a gas turbine combustor and

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supplying steam via nozzle 64, 68 to the combustor where the combustor operates with lean premixed fuel and air (col. 2, line 29). The water injection system would inherently be able to operate in a first and second mode depending on the load. There are further a plurality of domes (5 in total), any 3 of which can be read on the claimed 3 domes (see fig. 1).

10. Claims 1, 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al (4,327,547). Hughes et al teach a water injection system 40 with a dual fuel nozzle with liquid fuel 32, and gaseous fuel 42, where the injector is inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized.

11. Claims 1, 4-6, 12-15, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Maghon et al (4,701,124). Maghon et al teach a gas turbine combustor and supplying water and steam via nozzles 7, 8 to the combustor where the combustor operates with premixed fuel 24 and air, alternately, premixed fuel can come from 36, 37 (Fig. 3) in the pilot burner PB, the combustor has a dual fuel nozzle. The water injection system would inherently be able to operate in a first and second mode depending on the load. The premixed burner(s) are inherently operable fuel lean, i.e. so that complete combustion of the fuel occurs and/or so that CO emissions and unburned hydrocarbons are minimized.

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12. Claims 1, 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Aguet (3,461,667). Aguet teaches a water injection system 28, 30 where the combustor operates lean (see col. 3, lines 24-30) and the various modes of steam injection are controlled by valve 31.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 1-4, 6-11, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling et al (5,630,319) in view of either Horner et al (5,274,995) or Borkowicz et al (5,259,184). Horner teaches a combustor having 3 domes 61, 63, 65 and incorporating dual fuel premixers in each dome, i.e. of the type utilized by Joshi et al (see col. 3, 1st few lines) and which operate fuel lean (see col. 6, lines 4+ of Joshi et al 5,351,477). Horner does not teach water injection into the premixers. Horner et al and Borkowicz each teach that it is old and well known in the art to employ water/steam injection into the premixer of a gas turbine combustor in order to lower NOx emissions and/or CO emissions. It would have been obvious to one of ordinary skill in the art to employ water/steam injection with the premixers of Schilling et al, in order to facilitate low emissions.

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15. Claims 5, 12-14, 18-20 rejected under 35 U.S.C. 103(a) as being unpatentable over either Borkowicz or Schilling et al (5,630,319) in view of either Horner et al (5,274,995) or Borkowicz et al (5,259,184), as applied above and further in view of either Talabisco et al (5,357,741) or Maslak (4,928,478). The prior art teach various aspects of applicant's claimed invention but do not explicitly teach the water delivery system operable in first and second mode relative to a predetermined value. Talabisco et al teach that it is old and well known in the art to control the steam/water based on the load, among other variables (see abstract). Maslak teaches that it is old and well known in the art to control water/steam injection into the combustor with several different modes (see e.g. Fig. 4). It would have been obvious to one of ordinary skill in the art to control the steam/water injection by using a first and second mode with a predetermined value, as being a notoriously old and well known method utilized in the art. As for the that set point being greater than 90 percent of the rated power capability, that is within the ordinary skill in the art, as an obvious matter of finding the workable ranges in the art.

16. Claims 4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Schelp, Johnson, Hilburn or Horner, as applied above, and further in view of any of Belcher, Joshi and Borkowicz. As for the issue of dual fuel injection, the above prior art do not teach the use of dual fuel injection. However, Belcher, Joshi and Borkowicz teach that it is notoriously old and well known in the art to employ dual fuel injection, in order

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to accommodate multiple fuels, which can be chosen on considerations such as availability and/or cost and/or emissions.

Prior Art

17. There are numerous other references that could have been applied to applicant's claims but have not such that the office action could made sufficiently concise. The number of rejections applied above was necessitated by the undue breadth of applicant's claims.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted Kim whose telephone number is 703-308-2631.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe can be reached on 703-308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3588 for regular communications and 703-305-3588 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.



Ted Kim
Primary Examiner
January 15, 2001